Goulden Thurston Wetland Restoration Project

(COL-F19- W-2787)

Prepared for: Fish and Wildlife Compensation Program

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Prepared with financial support of the Fish and Wildlife Compensation Program on behalf of its program partners BC Hydro, the Province of BC, Fisheries and Oceans Canada, First Nations and public stakeholders.

August 20, 2019

Executive Summary

This project refers to “FWCP Riparian and Wetlands Action Plan and Habitat-based Action Plan” and aligns with the “Partner on restoration & land securement of wetland & riparian area habitat” priority actions. This project aimed to restore a degraded reed canary grass filled wetland used for grazing livestock and enhance wildlife habitat for a diversity of species. It is situated on private land owned by Rick Goulden and Bill Thurston. The Slocan River Streamkeepers have been involved with the landowners for many years and had previously implemented a riparian restoration project on their property in 2015 & 2016.

The area where the wetland restoration was completed had been disturbed in the past. The land was cleared of trees most likely in the early 1900s and had been used as a pasture for livestock for many years, as recently as 2017. An area of 0.5 hectares of shallow wetlands were created to provide habitat for a diversity of wildlife including western toad, Columbia spotted frog, painted turtle, bats, birds and a diversity of benthic invertebrates that provide food for other species. A total of one hectare was restored by planting surrounding area with a diversity of native species of trees, shrubs, sedges, and rushes, and installing bird nesting boxes, bat houses, and turtle nesting sites.

Many public outreach and educational events have taken place to raise awareness about the ecological functions and benefits of wetlands and the important role they play within the landscape.

In general, the functionality of the wetland has been restored. The area is flooded from May to June but dries up by late summer. The restoration project will allow the land to hold water for a longer period of time (possibly year round) thus allowing a wider diversity of species to thrive. Since the implementation of the project there has been a notable increase in the observations of birds, invertebrates, amphibians, and reptiles inhabiting and utilizing the wetlands. Many of the planted trees, shrubs, grasses, and sedges have taken hold and there is even natural regeneration of native plant species taking place. The pasture that was once a field of canary reed grass has been transformed into a wetland ecosystem teeming with life.

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Most wetlands in the Slocan Valley floodplain are on private land and have been degraded and undervalued for many years. In most cases, they have been cleared of trees, drained, filled and altered by landowners for agriculture and residential development. There is a great need to raise awareness about the ecological functions and benefits of wetlands and the important role they play within the landscape.

Due to the extensive degradation and alteration of wetland areas in the Slocan Valley, there is an increasing need for the restoration of ecological functions of wetlands to bring back habitat for plants and wildlife that thrive in wetlands. It is also beneficial to have more examples of fully functioning restored wetlands for the public to see and learn from.

Figure 1. The wetland area before the restoration project, June 2018.

Figure 2. The wetland area before the restoration project, July 2018.

2. Goals and Objectives

The main goals of this project are to restore wetland functionality, create habitat for a diversity of wetland species, re-establish native vegetation, and to lengthen the hydroperiod. This will be achieved by creating several distinct, shallow wetlands, planting native trees, shrubs, grasses, sedges and rushes around the wetlands and in disturbed areas, and by installing bird and bat nesting houses and snags along the shoreline.

3. Study Area

The project is located 5 km north of Winlaw on the east side of the Slocan River at latitude: 49.648739 N and longitude: -117.530713 W. It is situated in an old pasture surrounded by a cottonwood forest on private land owned by Rick Goulden and Bill Thurston. It is approximately one hectare of a four-hectare property that includes approximately two hectares of mature cottonwood forest and two hectares of old pasture. It is bordered by the Slocan River to the west, the Slocan Rail Trail to the east and two private properties to the north and south of the land.

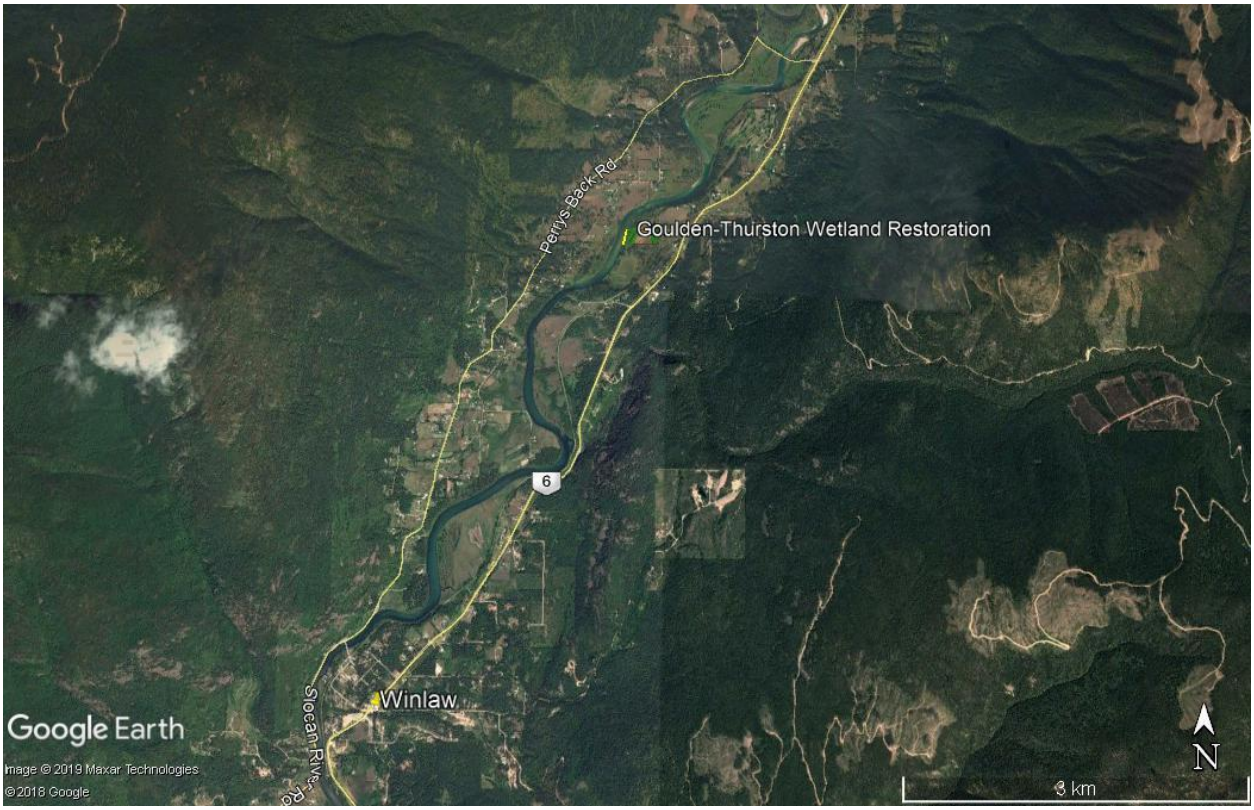

Figure 3. Google Earth photo of the site and Winlaw area

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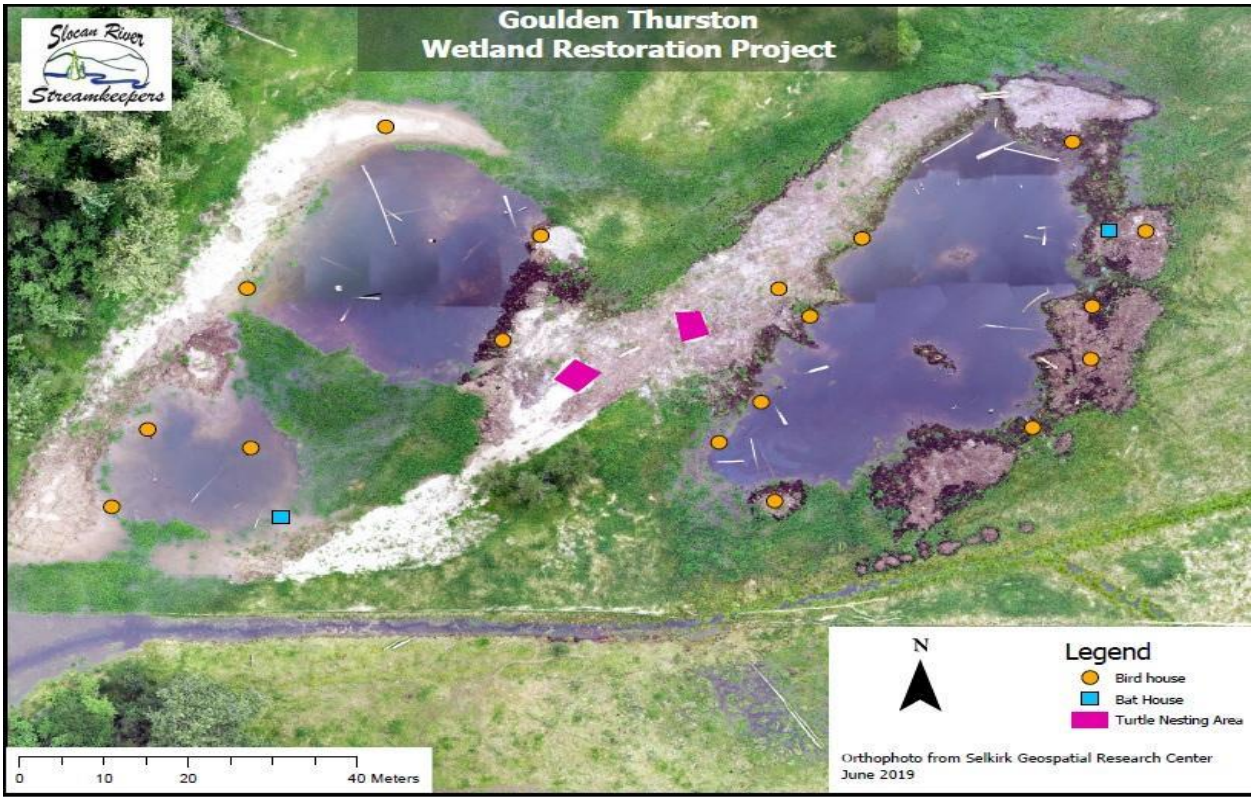

Figure 5. Map of Goulden Thurston Wetland Restoration Project, June 2019.

4. Methods

Three shallow wetlands were excavated in the southern part of the field. The excavation work was completed in January to minimize the impact on wildlife that inhabited the area and was done at a very gentle slope to minimize erosion. An elevated area between and around the wetlands was maintained in order to help prevent the spread of diseases and invasive species.

Large logs were placed in the wetlands to create habitat for a diversity of species including amphibians, reptiles and invertebrates. Logs were also planted upright along the shoreline to mimic snags for use by woodpeckers and other cavity nesting birds until eventually they rot away and provide food for insects.

Nesting boxes and bat houses were also installed along the shoreline on cedar logs to provide long term habitat for bats and swallows. Two turtle nesting sites of approximately 32 square metres were created with sand excavated from the wetland.

Native plants were planted by two different school groups in and around the disturbed area to create habitat and food for a diversity of species and improve plant diversity in areas overtaken by reed canary grass. The area was also seeded and mulched to prevent invasive non-native species from colonizing the area.

A long-term monitoring program is being developed in collaboration with Darcie Quamme, MSc., RPBio., of Integrated Ecological Research. Basic parameters such

as water and air temperature, pH, conductivity, water level, and wildlife observations are being monitored regularly by members of the Streamkeepers. A more detailed baseline assessment which additionally includes benthic invertebrate community, plant success, in-situ water quality, and lab samples was completed by Integrated Ecological Research in July 2019.

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5. Results and Outcomes

By project completion, 0.5 hectares of shallow wetland habitat was created resulting in one hectare of restored area including replanted areas, bird houses, etc.

In total:

- 312 native trees and shrubs, 300 sedges and rushes were planted,
- 20 bird nesting boxes were installed and 9 of them had swallows nesting in the spring 2019,
- 4 bat houses were installed, and
- 32 square metres of nesting habitat for turtles was created.

Many public outreach and education events have taken place to place to raise awareness about the ecological functions and benefits of wetlands and the important role they play within the landscape.

On May 12th, 2019 a tour of the restored wetlands was offered to the public and 12 people participated. They were very interested and supportive of the project.

On April 15th, 2019 a teacher from the Winlaw Elementary School brought a group of 12 students to the wetland to plant trees, shrubs and sedges. On May 9th, 2019 another group of 12 students and 2 coordinators from Sequoia Learning Centre in Crescent Valley came out to plant more trees, shrubs and sedges.

Several private tours of the wetlands have been offered to different groups of people and individuals to answer questions and explain the importance and the ecological functions of wetlands. One of those included a small group of academics from UBC and other Universities across North America sharing and learning about the connection between psychology, philosophy and ecology. Subsequently, Gregoire Lamoureux was invited to make a presentation about wetlands at their annual retreat held in the Slocan Valley at which time some of the participants came for a tour of Goulden Thurston Wetland Restoration Project.

On May 30th, 2019 the Slocan River Streamkeepers organized and hosted a presentation with internationally renowned Dr. John Todd, an innovative restoration ecologist and marine biologist who shared about his 50 years of ecological restoration projects from around the world. Prior to his presentation, Gregoire Lamoureux presented the riparian and wetland work of Slocan River Streamkeepers, including the Goulden Thurston Wetland Restoration Project, to a crowd of 70 people in Nelson.

In the Fall 2018, Gregoire Lamoureux gave a tour of Crooked Horn Wetland Restoration Project (completed in June 2017) to a group of approximately 50 people (biologists, restoration ecologists, etc.) participating in Kootenay Conservation Program Annual Fall Gathering.

The Slocan River Streamkeepers were also invited to a public meeting in Winlaw in October 2018 regarding the upcoming referendum on Mosquito Control to share their knowledge about wetland ecology and their experience with wetland restoration. The meeting was well attended by approximately 50 people. The referendum was later defeated with 74.9% voting against the use of Mosquito Control in the Slocan Valley.

On October 13th, 2019 a viewing of "*Primeval: Enter the Incommapleux*" was hosted by the Slocan River Streamkeepers in collaboration with Valhalla Wilderness Society at Winlaw Hall.
The short video of Crooked Horn Wetland Restoration Project was also presented at the event to a crowd of 70 people. It has also been viewed online by 379 people.

In February 2019, Gregoire Lamoureux, restoration ecologist with Slocan River Streamkeepers, presented a webinar on Riparian and Wetland Restoration in the Slocan Valley. The event was sponsored by Kootenay Conservation Program and

Columbia Basin Watershed Network and was attended by 54 participants. It has now been viewed by 134 people on YouTube.

The local and regional community are very supportive of the project and many members of the community expressed an interest in having more similar projects being implemented around the Slocan Valley.

Figure 26. Poster for the public tour of the wetlands.

6. Conclusion

In general, the functionality of the wetland has been restored. The area is flooded from May to June but dries up by late summer. The restoration project will allow the land to hold water for a longer period of time thus allowing a wider diversity of species to thrive. Since the implementation of the project there has been a notable increase in the observations of birds, invertebrates, amphibians, and reptiles inhabiting and utilizing the wetlands. Many of the planted trees, shrubs, grasses, and sedges have taken hold and there is even natural regeneration of native plant species taking place. The pasture that was once a field of canary reed grass has been transformed into a wetland ecosystem teeming with life.

Goulden Thurston Wetland Bird Observation List:

June 16, 2019
Canada goose - 6
Mallard - 26
Common Goldeneye - 2
Osprey - 1
Northern Flicker - 2
Least Flycatcher - 1
Hammond's Flycatcher - 2
Cassin's Vireo - 1
American Crow - 3
Rough-winged Swallow - 4
Tree Swallow - 6
Swainson's Thrush - 1
American Robin - 1
Song Sparrow - 2
Yellow Warbler - 1
Wilson's Warbler - 1
Yellow-rumped Warbler - 2

May 21, 2019 (7-8am)
Woodpecker sp.
Canada goose
Mallard
Swallow sp.
Wilson's Snipe
Black-capped Chickadee
Least Flycatcher
American Crow
Warbling Vireo
American Robin
Yellow-rumped Warbler
Orange-crowned Warbler
Common Yellowthroat
Red-breastd Nuthatch
Song Sparrow
Yellowthroat - 2

Table 1 Wildlife Observations	
Type	**Quantity**
Tadpole	1
Sand Piper	1
Damsel dragonfly	30
Red dragonfly	10
White tail dragonfly	30
Robins	2
Osprey	1
Swallow Tail Butterfly	2
Deer	tracks
Observations collected on June 11th, 2019	

Table 2 Summary of Water Quality Data Wetland 1					
Date	**Temp**	**Depth**	**pH**	**Cond**	**DO mg/L**
April 5th	0	dry			
April 15th	0	dry	5,5		
May 17th	15	0,35			
June 11th	21,5		7,5	195	4,5
Wetland 2					
Date	**Temp**	**Depth**	**pH**	**Cond**	**DO mg/L**
April 5th	0	dry			
April 15th	12		5,5		
May 17th	16,5				
June 11th	21,8			205	
Wetland 3					
Date	**Temp**	**Depth**	**pH**	**Cond**	**DO mg/L**
April 5th	10,1	0,3			
April 15th	11,3		6,5		
May 17th	17,5				
June 11th	23,9		7,9	189	5

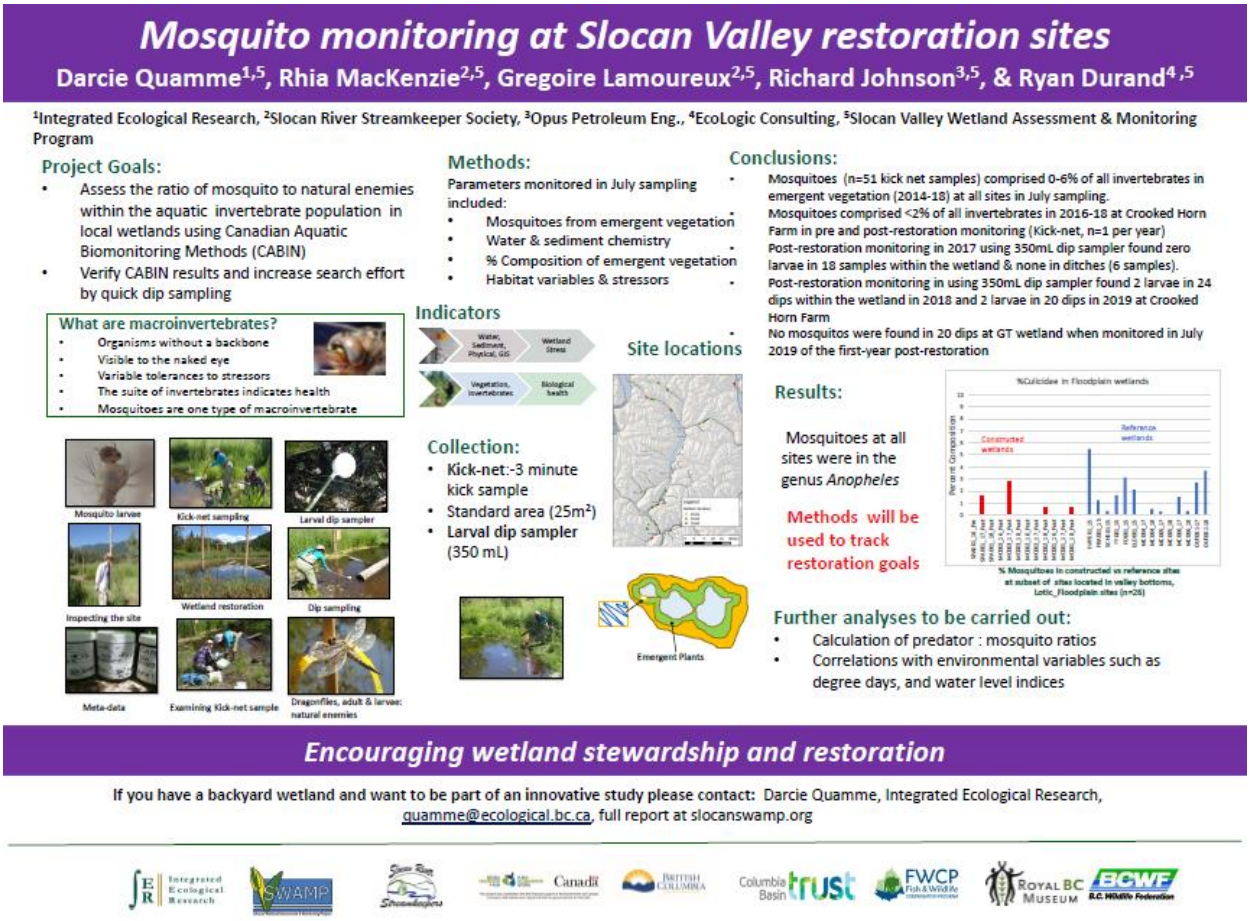

Figure 27. Poster for Mosquito Monitoring at Slocan Valley Restoration Sites.

7. Recommendations

On-going monitoring is recommended for the Goulden Thurston Wetland to document important changes to plant and wildlife success and diversity, and to be able to adapt plans for future successful wetland restoration projects.

We are planning a phase 2 wetland restoration project at Goulden Thurston, to expand the wetland restoration around the existing restored wetland at the north end of the property. This area would also benefit from excavating additional shallow wetlands, planting native trees, shrubs and sedges, installing bird and bat boxes, etc. to enhance wildlife habitat for a diversity of species and restore native plant communities.

Continued monitoring of Crooked Horn Farm Wetland is also recommended. We are in the early stage of planning for a phase 2 at Crooked Horn Farm, to expand the wetland restoration that was completed in 2017. This site will also benefit from excavating additional shallow wetlands, planting native trees, shrubs and sedges, installing bird and bat boxes, etc. to enhance wildlife habitat for a diversity of species and restore native plant communities.

8. Acknowledgements

Thanks to:

Fish and Wildlife Compensation Program
Columbia Basin Trust
Columbia Basin Watershed Network
World Wildlife Fund
Loblaws
Slocan Integral Forestry Cooperative
BC Wildlife Federation
Slocan Wetlands Assessment and Monitoring Project
Selkirk Geospatial Research Centre
Slocan River Streamkeepers
Slocan Solutions
Integrated Ecological Research
Durand Ecological Ltd
Rick Goulden, Bill Thurston and Quentin Hughson

9. References

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Wetland Restoration at Crooked Horn Farm in Winlaw, BC (COL-F17-W-1438) Report Prepared for: Fish and Wildlife Compensation Program by: Gregoire Lamoureux June 30, 3017.